Incidentally detected emphysematous pyelonephritis

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KEY WORDS

diabetes mellitus ◗ emphysematous pyelonephritis ◗ stone disease ◗ ultrasonography

ABSTRACT

Emphysematous pyelonephritis (EP) is a rare, severe gas forming infection of renal parenchyma and its surrounding areas and potentially life threatening condition that requires prompt evaluation and treatment. Although it commonly present with a fulminant clinical picture of sepsis, relatively mild symptoms can also be encountered. To our knowledge, incidentally detected emphysematous pyelonephritis has not been reported so far. We report a case of EP that was incidentally detected during evaluation for diabetes.

INTRODUCTION

Emphysematous pyelonephritis is a rare but life threatening necrotizing infection of the kidney caused by gas-forming bacteria. The most frequent causative microbe is *E. coli* followed by *Klebsiella pneumonia* [1]. Patients usually present with features of acute severe pyelonephritis, positive blood and urine cultures (in majority), urosepsis, and shock. Pathogenesis of EP is unclear but diabetes and obstructing urinary calculi are the commonest predisposing factors. Other risk factors are immune-suppression, alcoholism, cirrhosis, and kidney failure.

CASE PRESENTATION

A 49-year-old male presented to our hospital with complaints of generalized weakness and polydipsia for two weeks. There was no history of fever, abdominal pain, or lower urinary tract symptoms. He was not a known diabetic till this presentation. He had no relevant medical or surgical history and had been in good health. General physical examination was unremarkable and no flank tenderness was present.

Hemogram and blood counts were normal. Blood urea nitrogen was 20 mg/dl and serum creatinine was 1.6 mg/dl. Random blood sugar was 716 mg/dl. Urine analysis showed presence of sugar and 5 WBC/HPF. Urine and blood culture were sterile.

Ultrasound revealed multiple hyper echoic areas with dirty distal acoustic shadowing (gas) in all calyces and within the renal parenchyma of the mildly enlarged right kidney (RK; size of RK– 12.6 x 6.9 cm), no intrarenal or perinephric collection was seen and the pelvicalyceal system was compact (Fig. 1). The left kidney (LK; size – 9.2 cm) showed a 6 mm calculus in the midpole calyx.

Non-contrast computed tomography (CT) showed gas within the parenchyma of the RK and small radiopaque shadow (calculus) in the midpole of the LK (Fig. 2).

Diagnosis of EP was made on the basis of imaging [2, 3, 4]. He was started on insulin and parenteral antibiotics. After three weeks of hospitalization he had improved sense of well being, with no symptoms escalation. Patient was discharged on oral antibiotics for three weeks with controlled blood sugar level.

Patient was reviewed after six weeks. He was asymptomatic and afebrile with normal blood sugar level. Ultrasound showed both kidneys echogenic with no evidence of gas or hydronephrosis, a small 5mm calculus in lower pole of LK was noted.

Tc-99m diethylene-triamine-penta-acetic acid (DTPA) renogram showed bilateral compromised function (left >right) with glomerular filtration rate (GFR) of 22.5 ml/min, and 12 ml/min of right and left kidneys respectively, and good drainage on both sides. Glucoheptonate renogram (GHA scan) showed irregular contoured right kidney with linear photopenic defect in the anterolateral aspect with heterogeneously decreased uptake and linear photopenic defect in the anterior aspect of left kidney noted. Voiding cystoure-

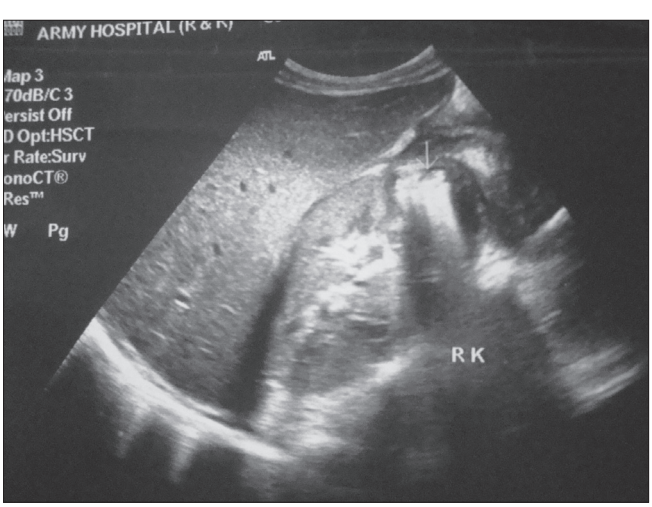

Fig. 1. Longitudinal scan of the right kidney showing echogenic foci of air (arrow) inside the renal parenchyma. Note the 'dirty' shadow (black arrow).

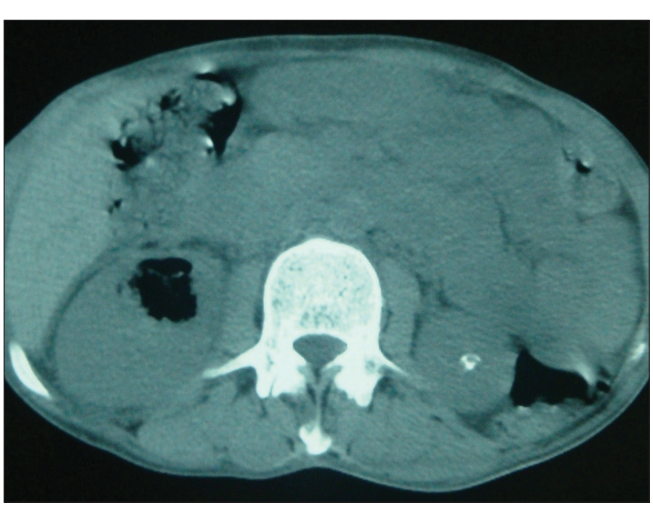

Fig. 2. Non-contrast CT scan showed gas within the parenchyma of right kidney and small radiopaque shadow (calculus) in the midpole of left kidney.

throgram (VCUG) was normal. Patient was discharged and advised for monthly follow-up.

DISCUSSION

EP presents particularly in diabetic (DM) patients and is associated with obstructive uropathy [5]. It is associated with high mortality rate. In a meta-analysis published by Falagas et al. there was a 25% mortality rate with an 11-42% range in a total of 175 patients [6].

Our case presented with nonspecific, generalized symptoms and detected to have type 2 diabetes mellitus. During evaluation for diabetes he was found to have gas in the pelvicalyceal system and renal parenchyma of the right kidney. This was a class 2 emphysematous pyelonephritis, as per classification system given by Huang et al. [1].

We did not consider any surgical intervention at first place since patient was stable, afebrile and asymptomatic. Conservative treatment was planned [7]. His blood sugar stabilized and he was discharged on oral hypoglycemic agent and antibiotics.

We confirmed bilateral non-refluxing renal units on voiding cystourethrogram. His bilateral scarred and poorly functioning kidneys can be attributed to diabetic nephropathy, superimposed by recurrent low-grade infection [8]. However, the absence of systemic symptoms in presence of class 2 emphysematous pyelonephritis and uncontrolled blood sugar was unclear.

It can probably be explained by a decreased local tissue immune response due to the high tissue glucose level and impaired tissue perfusion and / or low virulence of the gas forming organism. It is further supported by the fact observed by Huang et al. that poor control of blood glucose levels is not a risk factor of poor prognosis for EPN [1, 9].

CONCLUSION

The patient presented here was incidentally detected to have emphysematous pyelonephritis during evaluation for diabetes and was successfully treated with medical management. Asymptomatic emphysematous pyelonephritis has not been reported so far.

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